

ABSTRACT

In accordance with an embodiment of the present invention, a pump assembly for circulating a supercritical fluid is disclosed. The pump assembly comprises an impeller for pumping fluid between a pump inlet and a pump outlet; a rotating pump shaft coupled to the impeller, wherein the pump shaft is supported by corrosion resistant bearings; a rotor of a DC motor potted in epoxy and encased in a non-magnetic material sleeve; and a stator sealed from the fluid via a polymer sleeve. The pump can be of centrifugal type. The bearings can be made of silicon nitride balls combined with bearing races made of Cronidur® and can operate without oil or grease lubrication. The polymer sleeve can be a PEEK™ sleeve which forms a casing for the stator. The non-magnetic material sleeve encasing the rotor of the DC motor is preferably made of stainless steel. A portion of the fluid passing through the pump assembly can be diverted over the bearings and/or the rotor and stator.